

**REMARKS**

The examiner has objected to claim 11 as having "electrically" misspelled. This has been corrected by the amendment to the claims. The examiner has also rejected claim 5 under 35 U.S.C. §112 as being indefinite for failing to point out and distinctly claim the subject matter which applicants regard as the invention. In a telephone conversation with Examiner Haran, the Examiner indicated that the rejection was improvident and that the undersigned could ignore it. The amendments to the claims do not constitute new matter since antecedent bases are found in the specification at *inter alia* page 5, lines 7-16, and page 8, lines 15-20. (The amendments to the claims are not intended to change the scope of the claims, but rather to make explicit in the amended claims what was implicit in the claims before amendment.)

The examiner has rejected claims 1-6 and 19-20 as being unpatentable over the admitted prior art in view of Koch et al, US Patent 6,309,494, hereinafter Koch et al, under 35 U.S.C. §103(a). This rejection is not thought to be well taken, especially in view of the amendments to claims 1 and 19 upon which claims 2-6 and 20 depend, directly or indirectly.

With respect to the admitted prior art, this section merely points out the problems with prior art solutions, or their shortcomings. It in no way suggests the solution of the present invention. It is pointed out that the application reiterates that silicones are particularly difficult to bond to other devices. This is especially true when the silicones have silicone oils or other products that contain silicone residues on the surface. This is the case with the present invention wherein silicone mold releases are incorporated in the molding product, and are present on the surface of the resultant molded article. Koch et al relate to tire art and have nothing to do with bonding heat sinks to encapsulated chips. Since tires are not made from silicone with a silicone oil mold release, Koch et al could not teach or suggest the solution when there is silicone oil or

other residual silicone products on the surface of the silicone article. Moreover, Koch et al teach removing a cure skin on the surface of the tire by roughening, and the use of a rubber primer over the roughened surface, and preferably uses a solvent to clean or remove any residue from the surface. As pointed out in the application at page 2, line 24, through page 3, line 6:

One attempt at resolving the problem of mechanical attachment involves using adhesive to create a uniform bond between the package's cover (overmold) member and a heat sink. Unfortunately, many electronic packages are made of substances or are assembled with substances to which it is very difficult to adhere a heat sink. Typical adhesives that are expected to bond to polymer compounds will not effectively bond a heat sink to polymer compounds typically used as package overmold materials. This problem has been encountered in the production of plastic ball grid array (PBGA) packages, in particular, PBGA packages with an overmold cover over the package's chip(s). Examples of such packages are defined in 6,206,997, 5,729,440, 5,726,079 and 5,655,703. All of these patents, assigned to the assignee of this invention, are incorporated herein by reference.

Silicone residue cannot be easily removed and solvents will not accomplish this; thus, there is no teaching of the reduction of the effect of silicone oils and silicone residual products by the use of abrasive products, even in the non-relevant tire art. Claim 1 is directed to a process of bonding a heat sink to a dielectric material wherein there is silicone oil or other silicone containing residue on the surface of the dielectric material wherein the surface is roughened with an abrasive material. Claim 19 is the article counterpart of this method claim with essentially the same limitations. Since the prior art, including the applicants' admitted prior art, does not show this, it is believed that claims 1 and 19 are clearly allowable.

Claims 2-6 are dependent upon claim 1, directly or indirectly, and, for the same reasons, are believed to be allowable. Additionally, each of these claims relates to certain conditions that improve the adhesion characteristics of the heat sink and, since none of the prior art recognizes this treatment for a surface with silicone oil or other silicone containing residues, the claims cannot be obvious.

It is not enough that one may modify a reference in view of a second reference, but rather it is required that the second reference suggest modification of the first reference and not merely provide the capability of modifying the first reference.

The CAFC stated In re Piasecki, 745 F.2d 1468, 223 USPQ 785, 788 (Fed. Cir. 1984) the following:

"The Supreme Court in Graham v. John Deere Co., 383 U.S. 1 (1966), focused on the procedural and evidentiary processes in reaching a conclusion under Section 103. As adapted to ex parte procedure, Graham is interpreted as continuing to place the "burden of proof on the Patent Office which requires it to produce the factual basis for its rejection of an application under sections 102 and 103". Citing In re Warner, 379 F.2d 1011, 1020, 154 USPQ 173, 177 (CCPA 1967)."

The law is quite clear that in order for a claimed invention to be rejected on obviousness, the prior art must suggest the modifications sought to be patented; In re Gordon, 221 U.S.P.Q. 1125, 1127 (CAFC 1984); ACS Hospital System, Inc. v. Montefiore Hospital, 221 U.S.P.Q. 929, 933 (CAFC 1984). The foregoing principle of law has been followed in Aqua-Aerobic Systems, Inc. v. Richards of Rockford, Inc., 1 U.S.P.Q. 2d, 1945 (D.C. Illinois 1986). In the Aqua-Aerobic's case, the Court stated that the fact that a prior reference can be modified to show the claimed invention does not make the modification obvious unless the prior reference suggests the desirability of the modification. The CAFC in the case of In re Gorman, 18 U.S.P.Q. 2d (CAFC 1991) held at page 1888:

"When it is necessary to select elements of various teachings in order to form the claimed invention, we ascertain whether there is any suggestion or motivation in the prior art to make the selection made by the applicant [citation]. 'Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination [citations]. . .

The references themselves must provide some teaching whereby the applicant's combination would have been obvious."

Further, the CAFC, in In re Oetiker, 24 U.S.P.Q. 2nd 1443, 1445 (CAFC 1992) held:

There must be some reason, suggestion, or motivation found in the prior art whereby a person of ordinary skill in the field of the invention would make the combination. That knowledge can not come from the applicant's invention itself.

Most significantly, the CAFC in the recent case of In re Dembiczak, 50 U.S.P.Q.2<sup>nd</sup> 1614 (CAFC 1999) held at 1617:

...(examiner can satisfy burden of obviousness in light of combination 'only by showing some objective teaching [leading to the combination]');

Thus, it is clear that where an individual reference does not teach the entire invention, then the modification which the invention represents must be suggested and motivated by some other reference through some objective teaching and cannot come from the application itself, which is not the case here. Hence, for these additional reasons, claims 2-6 are believed to be allowable.

Claims 7-10 have been rejected under 35 U.S.C. §103(a) as being unpatentable over the admitted prior art in view of Koch et al, and further in view of Roth. US Patent 5,938,854, hereinafter Roth. This rejection is not thought to be well taken. First of all, claims 7-10 are dependent, directly or indirectly, on claim 1, and Roth does not overcome the deficiencies of Koch et al and the admitted prior art. Thus, for this reason, claims 7-10 are allowable.

Moreover, it is submitted that the examiner misapprehends the function of the plasma in the applicants' invention. As stated in the parent case, and reiterated in the present application at page 7, line 13, through page 8, line 4, the purpose of the plasma in the instant application is not to clean the surface, but rather to convert the surface silicone oils and silicone residues to a smooth adherent surface. Roth describes using plasma processing to remove the final few monolayers of machining oils and plasticizers. So, plasma is used as a cleaning process to remove adverse contaminants, not to convert the surface oils and silicone residues on the surface to a more adherent surface. In the present application, plasma is used to chemically convert an undesirable contaminant to a more desirable surface. As indicated above, the silicone mold

release is imparted to the bulk transfer molding pellet and, during molding, some of the release agent migrates to the mold surfaces to facilitate release. As stated in Roth, chemical cleaning of the surfaces is never effective to completely remove all contaminants. Siloxanes, which encompass the form most assumed by the silicone oils, are particularly resistant to cleaning and always linger at a level that is troublesome for adhesive bonding. If the surface is cleaned, more silicone will simply migrate from the bulk to the surface. Anything it removes can be replenished from the bulk. Plasma converts the silicone to silica, which is a much easier surface for bonding. Further, silica or the glass coating seals off the silicone from the bulk. So, the plasma process is a robust solution to siloxane laden molding compounds. Hence, it is not obvious that simple abrasion followed by a plasma treatment would provide the necessary improvement to adhesion. Thus, claim 7 is clearly allowable over any reasonable combination of the admitted prior art, Koch et al and Roth.

Claims 8-10 are dependent upon claim 7 and, for the same reasons, are believed to be allowable. Moreover, claims 8-10 contain certain process parameters which could not be gleaned from Roth since Roth is using plasma in a different manner. Thus, since none of reference teaches these limitations, claims 8-10 are allowable for these additional reasons.

The examiner has rejected claims 11 and 21 under 35 U.S.C. §103(a) as unpatentable over the admitted prior art in view of Koch et al and further in view of Lin et al, US Patent 5,450,283, hereinafter Lin et al. This rejection is not believed to be well taken. First, claim 11 is dependent upon claim 1, and claim 21 is dependent upon claim 19, and Lin et al do not overcome the deficiencies of these references which are pointed out above. Additionally, Lin et al describe a chip package with a chip backside directly exposed. A chip backside does not present the same challenges for a heat spreader attachment as does an overmold with silicone mold release. No

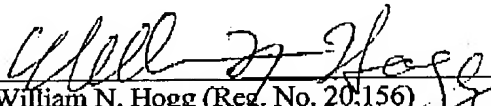
mention is made of silicone mold release problems on the chip backside, even though transfer molding is used to overmold the sides of the chips. Thus, for this additional reason, claims 11 and 21 are believed to be allowable.

The examiner has rejected claims 7-10 on the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-5 of US Patent 6,206,997 in view of Koch et al. This rejection is not thought to be well taken. For the reasons pointed out above, it is not believed that Koch et al make claim 1 obvious, and claims 7-10 depend therefrom. Thus, this rejection is not thought to be well taken.

In view of the above, it is believed that each of the claims in the application is distinguishable one from the other and over the prior art. Therefore, reconsideration and allowance of the claims is respectfully requested.

Respectfully submitted,

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